



**US Army Corps
of Engineers®**

Engineer Research and
Development Center

Hazardous Waste Research Center

Description

The [Hazardous Waste Research Center \(HWRC\)](#) is a full-service research and evaluation complex that provides research and development and innovative technology demonstration support to all Corps of Engineers Districts and Divisions, the 10 Environmental Protection Agency (EPA) regions under the Resource Conservation and Recovery Act, the Superfund Program, and the Assessment and Remediation of Contaminated Sediments Program under the Clean Water Act. The Center conducts research at all levels, from initial laboratory investigations to the development and application of new and innovative technologies onsite. Research is performed on a cost-reimbursable basis and is executed through a variety of Federal funding arrangements, including work with the private sector under cooperative research and development agreements (CRDAs) to expedite transfer of remediation technologies to the governmental and private sectors.

Capabilities

ERDC researchers have been evaluating hazardous and toxic waste for more than 20 years with over 500 successfully completed projects. The following list describes the broad range of innovative technology research and development activities conducted at the HWRC:

- Biotechnology for liquids, soils, sludges, and sediments
- Solvent extraction/flushing
- In situ solidification/stabilization
- Electrokinetics for metals in soils
- Physical separation/volume reduction
- Advanced chemical oxidation and reduction using UV light, ozone, hydrogen peroxide, peroxene, ultrasonics, and special catalysts (Fenton's reagent)
- Synthetic resin ion exchange
- Sorption studies (activated carbon/activated alumina, specialty resins)
- Volatile organic thermal treatment
- Phase transfer technologies
- Phytoremediation
- Contaminant flux modeling
- Field pilot assessment of groundwater treatment systems

Supporting Technology

- Automated Dredging and Disposal Alternatives Modeling System (ADDAMS) (contains integrated confined disposal facility design modules)
- SETTLE module (aids in the design of confined disposal facilities, particularly settling and initial storage)
- Primary Consolidation and Desiccation of Dredged Fill (PCDDF) module (evaluates consolidation, compression, and desiccation of dredged fill for determining long-term storage requirements)
- Determination of Hydraulic Retention Time and Efficiency of Confined Disposal Facilities (DYECON) module (determines the theoretical and mean retention times of a CDF and the resulting hydraulic efficiency).

Benefits

Work conducted in the HWRC makes cleanup technologies more complete, more cost-effective, and faster. The HWRC has taken the lead in the development of innovative technologies to treat explosives, heavy metals, and selected organic compounds. Technologies developed by the HWRC have been transferred to all military services for cleanup of groundwater and soils at many military sites and to the Environmental Protection Agency and states for remediation of Superfund sites.

Success Stories

- ERDC's HWRC conducted treatability studies and research studies that were used by the New England District in cleanup and remediation of PCB-contaminated sediments taken from New Bedford Harbor, Massachusetts.
- ERDC's HWRC conducted the engineering design work for the incinerator used in disposing of basin liquids at the Rocky Mountain Arsenal, Denver, CO.
- ERDC participated in an assessment of white phosphorus contamination at the Army installation at Fort McCoy, Wisconsin. White phosphorus was identified in impact area wetland sediments at Fort McCoy. Surficial wetland, soil, sediment, and water samples were analyzed for the entire suite of contaminants believed to be present. These contaminants included: explosive residues, heavy metals, petroleum hydrocarbons, and polycyclic aromatic hydrocarbons. White phosphorus was detected in wetland soils, aquatic sediment, surface water, and mussel tissue. It was not detected in groundwater samples. The explosive RDX was detected in surface water. Total petroleum hydrocarbons were elevated above background, as were heavy metals.
- ERDC participated in a study at the Craney Island Dredged Material Management Area (CIDMMA). The CIDMMA is used for the disposal of both maintenance dredged material and new work dredged material. The CIDMMA site was close to reaching capacity and the HWRC studied how much service life could be extended under a restricted use program (suitable material is barged to the sea and only contaminated material is placed in the disposal facility). The HWRC also assisted in determining contaminant losses and conducting a Comprehensive Analysis of Migration Pathways (CAMP). Results of the study showed that the service life of the CIDMMA could be extended under restrictive use for approximately 140 years under baseline conditions or 90 years under worst case conditions.

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